UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 7274

CSAH NO. 41

OVER THE

LE SUEUR RIVER

DISTRICT 7 - BLUE EARTH COUNTY

PREPARED FOR THE

MINNESOTA DEPARTMENT OF TRANSPORTATION

BY

COLLINS ENGINEERS, INC.

JOB NO. 5221 (CEI 133)

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

REPORT SUMMARY:

The substructure units inspected at Bridge No. 7274, Piers 1 and 2, were found to be in good to satisfactory condition. The top of the concrete diaphragm at both piers was exposed with up to 2.2 feet of vertical face exposure detected. The top of the diaphragm at Pier 2 exhibited heavy section loss with exposed steel reinforcing and aggregate. The channel bottom around the substructure was stable with no evidence of significant scour and no appreciable changes since the previous inspection.

INSPECTION FINDINGS:

(A) The top of the diaphragm was exposed along the south face of Pier 2 with up to 2.1 feet of vertical face exposure at the upstream end, and there was heavy section loss with exposed aggregate and reinforcing steel along the entire exposed portion.

(B) Two horizontal steel reinforcing bars were completely exposed and were no longer embedded in the concrete diaphragm at Pier 2 and four verical bars were exposed at the diaphragm of upstream column of Pier 2.

(C) The top of the diaphragm was exposed along the north face of Pier 1 with up to 2.2 feet of vertical face exposure at the upstream end.

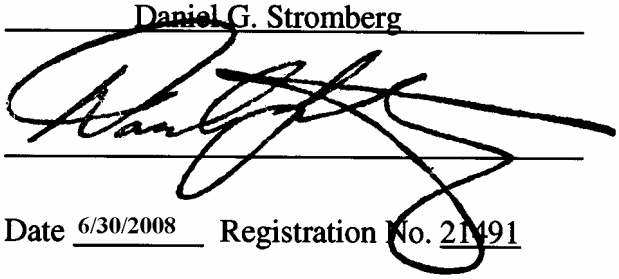
RECOMMENDATIONS:

(A) Ideally, the deteriorated concrete of the diaphragm at Pier 2 should be repaired by removing the unsound concrete and reforming with a concrete mix designed to promote high durability and low permeability. Continue to monitor the diaphragm deterioration until repairs are accomplished.

(B) Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of five (5) years.

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

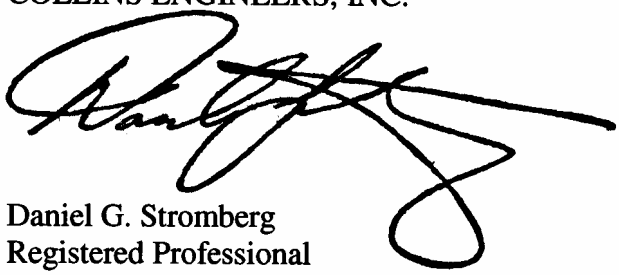
Daniel G. Stromberg



Date 6/30/2008 Registration No. 21491

Respectfully submitted,

COLLINS ENGINEERS, INC.



Daniel G. Stromberg
Registered Professional
Engineer, State of Minnesota

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

1. BRIDGE DATA

Bridge Number: 7274

Feature Crossed: Le Sueur River

Feature Carried: CSAH No. 41

Location: District 7 - Blue Earth County

Bridge Description: The bridge superstructure consists of three spans of multiple steel girders supporting a reinforced concrete deck. The superstructure is supported by two reinforced concrete abutments and two reinforced concrete piers. The abutments and piers are supported on reinforced concrete footings founded on timber piles. The piers are numbered 1 and 2 starting from the south end of the bridge.

2. INSPECTION DATA

Professional Engineer/Team Leader: Daniel G. Stromberg, P.E., S.E.

Dive Team: Clayton G. Brookins, Valerie Roustan

Date: November 19, 2007

Weather Conditions: Cloudy, 50ºF

Underwater Visibility: 2.0 feet

Waterway Velocity: 0.5 f.p.s.

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: Piers 1 and 2.

General Shape: The piers each consist of two circular columns supporting a common pier cap. The lower portions of the concrete columns are connected by a common diaphragm, all of which is supported by a rectangular concrete footing founded on timber piles.

Maximum Water Depth at Substructure Inspected: Approximately 2.8 feet.

4. WATERLINE DATUM

Water Level Reference: The top of the pier cap on the east end of Pier 1.

Water Surface: The waterline was approximately 19.6 feet below reference.
Waterline Elevation = 967.7.

5. NBIS CODING INFORMATION (Minnesota specific codes are used for 92B and 113)

Item 60: Substructure: Code 6

Item 61: Channel and Channel Protection: Code 7

Item 92B: Underwater Inspection: Code B/11/07

Item 113: Scour Critical Bridges: Code J/91

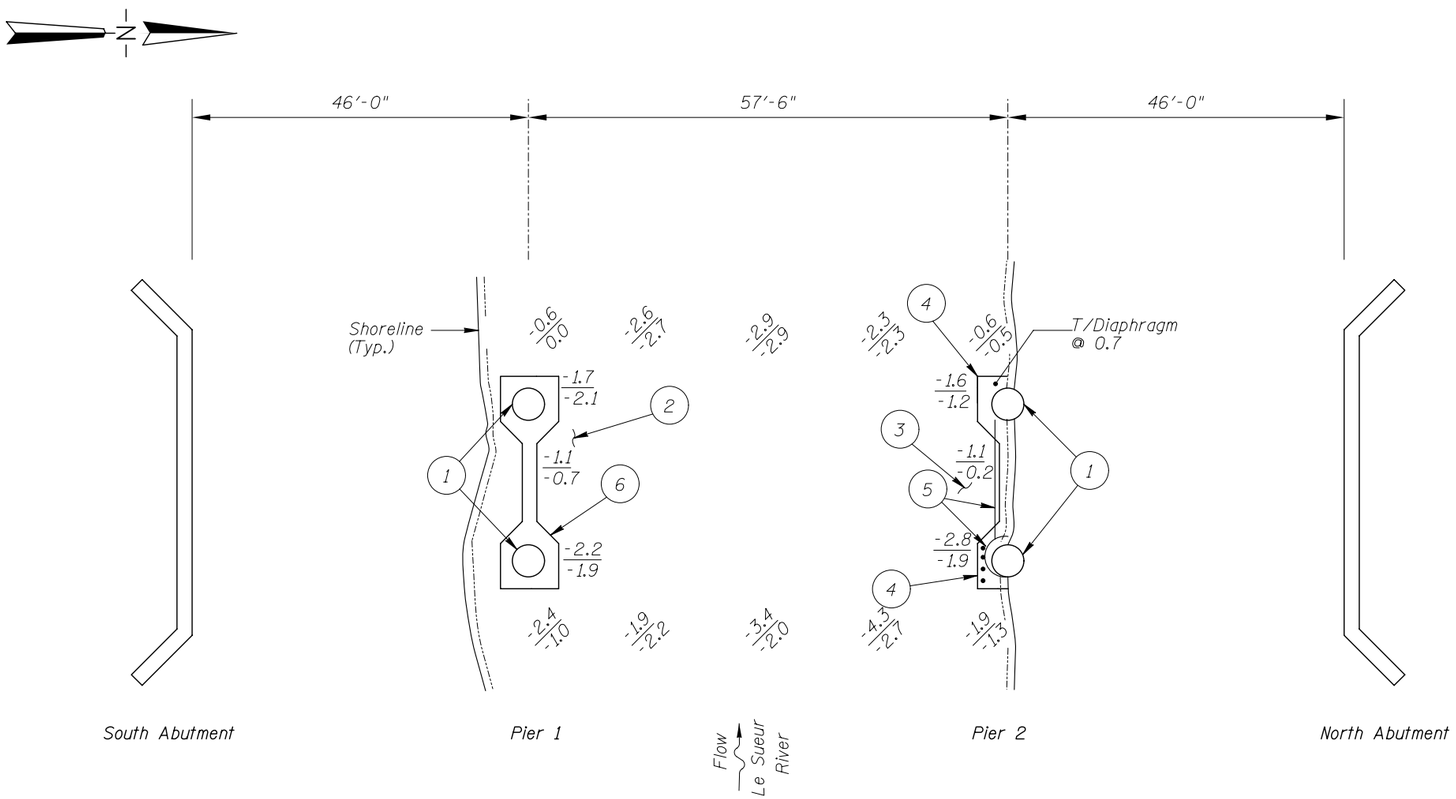
Bridge is scour critical because abutment or pier foundation is rated as unstable due to observed scour at bridge site.

_____Yes X No

Photograph 1. Overall View of Bridge, Looking Southeast.

Photograph 2. View of Pier 1, Looking South.

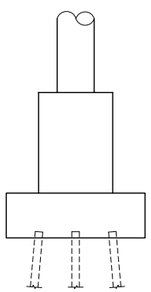
Photograph 3. View of Pier 2, Looking Northwest.



SOUNDING PLAN

INSPECTION NOTES:

1. Piers 1 and 2 were inspected underwater.
2. At the time of inspection on November 19, 2007, the waterline was located approximately 19.6 feet below the top of the pier cap at the upstream end of Pier 1. This corresponds with a waterline elevation of 967.7.
3. Soundings indicate the water depth at the time of inspection and are measured in feet.
4. Soundings were taken parallel to the bridge at 1/4 point intervals between the substructure units.



TYPICAL END VIEW OF PIERS

INSPECTION NOTES

1. Overall, the concrete columns were in good and sound condition.
2. The channel bottom at Pier 1 consisted of riprap with no probe rod penetration.
3. The channel bottom at Pier 2 consisted of sandy gravel and riprap with a probe rod penetration of 1 inch.
4. The top of the diaphragm was exposed along the south face of Pier 2 with up to 2.1 feet of vertical face exposure at the upstream end and there was heavy section loss with exposed aggregate and reinforcing steel along the entire exposed portion. Up to 1 foot of penetration was present for the section loss (upstream column mainly).
5. Two horizontal steel reinforcing bars were completely exposed and were no longer embedded in the concrete diaphragm and four vertical bars were exposed at the diaphragm of upstream column of Pier 2.
6. The top of the diaphragm was exposed along the north face of Pier 1 with up to 2.2 feet of vertical face exposure at the upstream end.

Legend

-2.0	Sounding Depth from Waterline (11/19/07)
-5.2	Sounding Depth from Waterline (11/2/02)
	Timber Debris

Note:

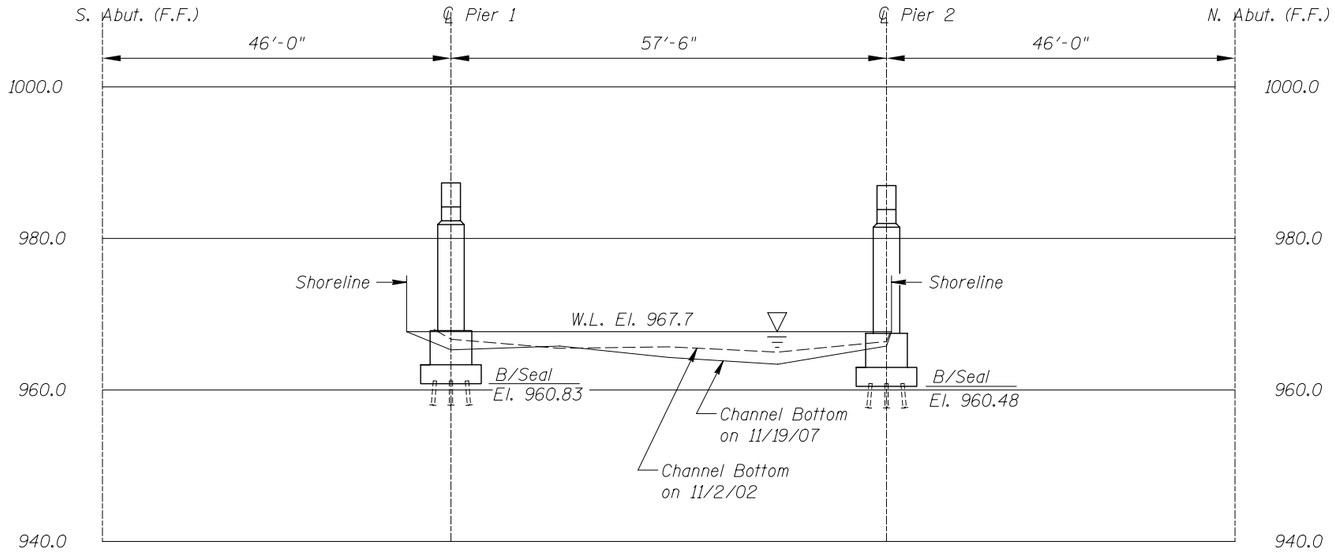
All soundings based on 2007 waterline location.

MINNESOTA
DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

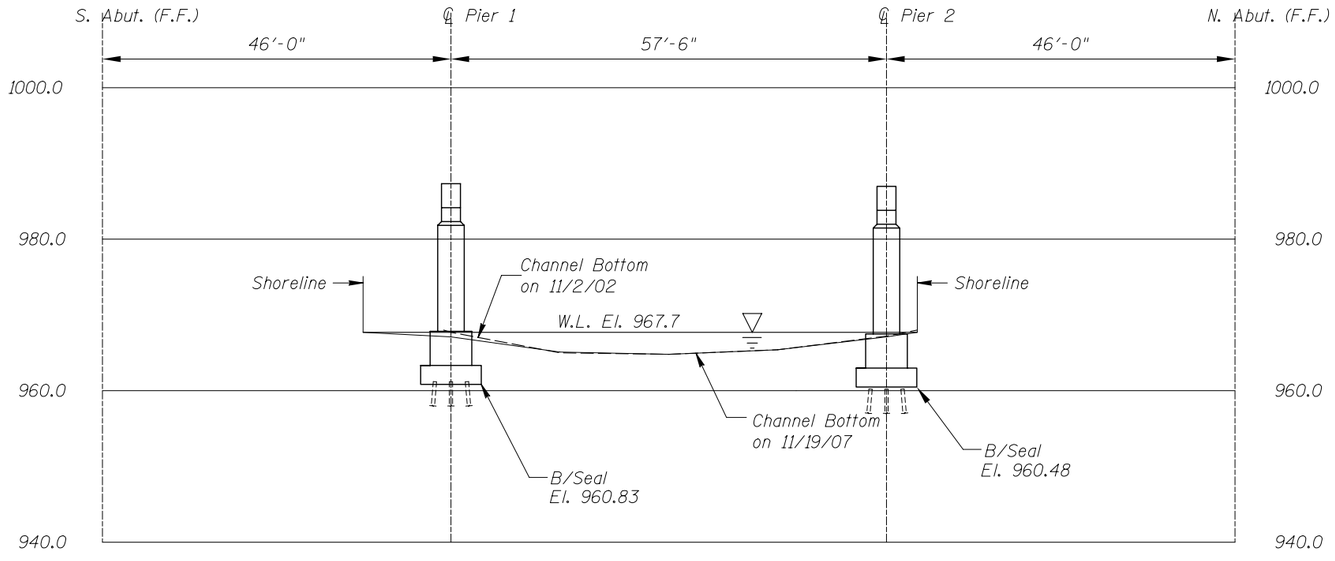
STRUCTURE NO. 7274
OVER THE LE SUEUR RIVER
DISTRICT 7, BLUE EARTH COUNTY

INSPECTION AND SOUNDING PLAN

Drawn By: LJ	COLLINS ENGINEERS, INC. 123 North Wacker Drive Suite 300 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com	Date: NOV. 2007
Checked By: VR		Scale: NTS
Code: 52210133		Figure No.: 1



UPSTREAM FASCIA PROFILE



DOWNSTREAM FASCIA PROFILE

Note:

Refer to Figure 1 for General Notes.

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DISTRICT 7, BLUE EARTH COUNTY

UPSTREAM AND DOWNSTREAM FASCIA PROFILES

Drawn By: LJ	COLLINS ENGINEERS 123 North Wacker Drive Suite 300 Chicago, IL 60606 (312) 704-0300 www.collinsengr.com	Date: NOV. 2007
Checked By: VR		Scale: 1"=20'
Code: 52210133		Figure No.: 2

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES
DAILY DIVING REPORT

INSPECTORS: Collins Engineers, Inc. DATE: November 19, 2007
ON-SITE TEAM LEADER: Daniel G. Stromberg, P.E., S.E.
BRIDGE NO: 7274 WEATHER: Cloudy, 50ºF
WATERWAY CROSSED: Le Sueur River
DIVING OPERATION: X SCUBA _____ SURFACE SUPPLIED AIR
_____ OTHER
PERSONNEL: Clayton G. Brookins, Valerie Roustan
EQUIPMENT: Scuba, Probe Rod, Lead Line, Sounding Pole, U/W Light, Scraper, Camera
TIME IN WATER: 4:00 P.M.
TIME OUT OF WATER: 4:30 P.M.
WATERWAY DATA: VELOCITY 0.5 f.p.s.
VISIBILITY 2 feet
DEPTH 2.8 feet maximum at Pier 2
ELEMENTS INSPECTED: Piers 1 and 2
REMARKS: Overall, the concrete piers were in good to satisfactory condition. The top of the diaphragm at both piers was exposed with up to 2.2 feet of vertical face exposure at the upstream ends. The top of the exposed diaphragm at Pier 2 exhibited heavy section loss and exposed aggregate and reinforcing steel was present along the entire exposed portion. The channel bottom appeared stable with no evidence of significant scour.

FURTHER ACTION NEEDED: X YES _____ NO

Ideally, the deteriorated concrete of the diaphragm at Pier 2 should be repaired by removing the unsound concrete and reforming with a concrete mix designed to promote high durability and low permeability. Continue to monitor the diaphragm deformation until repairs are accomplished.

Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of five (5) years.

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES

UNDERWATER INSPECTION CONDITION RATING FORM

BRIDGE NO. 7274
INSPECTORS Collins Engineers, Inc.
ON-SITE TEAM LEADER Daniel G. Stromberg, P.E.,S.E.
WATERWAY CROSSED Le Sueur River

INSPECTION DATE November 19, 2007

NOTE: USE ALL APPLICABLE CONDITION DEFINITIONS AS DEFINED IN THE MINNESOTA RECORDING AND CODING GUIDE INCLUDING GENERAL, SUBSTRUCTURE, CHANNEL AND PROTECTION, AND CULVERTS AND WALL DEFINITIONS TO COMPLETE THIS FORM.

CONDITION RATING

			SUBSTRUCTURE						CHANNEL					GENERAL					
UNIT REFERENCE NO.	UNIT DESCRIPTION	MAXIMUM DEPTH OF WATER	PILING	COLUMNS, SHAFTS, OR FACES*	FOOTINGS	DISPLACEMENT	OTHER (DIAPHRAGM)	OVERALL SUBSTRUCTURE CONDITION CODE*	SCOUR	EMBANKMENT EROSION	EMBANKMENT PROTECTION	OTHER (DRIFT/DEBRIS)	OVERALL CHANNEL & PROTECTION CONDITION	CONCRETE	STEEL	TIMBER	LOSS OF SECTION	PREVIOUS REPAIR OR MAINTENANCE	OTHER
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
	Pier 1	2.4’	N	7	N	9	7	7	8	7	7	N	7	7	N	N	N	N	N
	Pier 2	2.8’	N	7	N	9	5	6	8	7	7	N	7	7	N	N	N	N	N

*UNDERWATER PORTION ONLY

REMARKS: Overall, the concrete piers were in good to satisfactory condition. The top of the diaphragm at both piers was exposed with up to 2.2 feet of vertical face exposure at the upstream ends. The top of the exposed diaphragm at Pier 2 exhibited heavy section loss and exposed aggregate and reinforcing steel was present along the entire exposed portion. The channel bottom appeared stable with no evidence of significant scour.

NOTES: ATTACH SKETCHES AS NEEDED, IDENTIFY REMARK BY REFERRING TO UNIT REFERENCE NO. AND REMARK NO.
USE GENERAL SECTION TO IDENTIFY OVERALL PRESENCE OF SPALLS, CRACKS, CORROSION, ETC.